

PROGRESS  
OF  
MEDICAL SCIENCE  
—  
MEDICINE

UNDER THE CHARGE OF

W. S. THAYER, M.D.,

PROFESSOR OF CLINICAL MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE,  
MARYLAND,

AND

ROGER S. MORRIS, M.D.,

FREDERICK FORCHHEIMER PROFESSOR OF MEDICINE IN THE UNIVERSITY OF  
CINCINNATI, CINCINNATI, OHIO.

The Infectiousness of the Cerebrospinal Fluid in Syphilis.—FRUEHWALD and ZALOZIECKI (*Berl. klin. Wochenschr.*, 1916, 53, 8) point out that the pathology of syphilis of the central nervous system has been advanced a great deal through studies on the cerebrospinal fluid. After it was discovered that the *Treponema pallidum* is the cause of syphilis, it was looked for by numerous investigators in the cerebrospinal fluid, and found particularly by microscopic methods and particularly through animal inoculations. The authors' work on this particular subject was interrupted by the onset of the war, but they had advanced far enough to secure some definite positive results, which were as follows: (a) No positive results were obtained in cases of tabes or general paresis. (b) Positive results by inoculation methods were obtained in an early secondary case with manifest central nervous system symptoms, and in two others, late cases of secondary lues in one of which the spinal fluid was entirely normal, and in the other there was a positive Wassermann reaction. The authors were unable to arrive at any rule by which one might judge the infectiousness of the cerebrospinal fluid in any stage of syphilis. An analysis of the literature on the subject to date reveals the following facts:  
*A. Acquired lues.* (1) Without nervous manifestations: (a) primary lues up to the eighth week negative; (b) primary and secondary lues eighth to tenth week, 2 positive; (c) late secondary lues, third to twelfth month, 5 positive cases; (d) tertiary lues negative. (2) With congenital nervous symptoms: (a) early luetic meningitis, 1 positive case; (b) "neurorecidiv," 1 positive case; (c) luetic apoplexy and hemiplegia, 2 positive cases; (d) late luetic meningitis, 1 positive case; (e) tabes dorsalis, 2 positive cases; (f) paresis, 5 positive cases.

B. Congenital lues: (a) early cases, 2 positive cases; (b) late cases, 2 positive. It will be seen from this analysis that the greatest number of positive results occur in the late secondary stage and that a relatively large number of positive findings are obtained in the later syphilitic involvements of the central nervous system. All told, however, the causative agent is found quite infrequently. Spinal fluids containing the treponema may be entirely normal otherwise, in association with a positive or negative blood Wassermann reaction and in the complete absence of nervous manifestations.

**Open Puncture of the Pleura.**—SCHMIDT (*Münch. med. Wochenschr.*, 1915, lxii, 873) makes further report on open puncture of the pleural cavity, a therapeutic procedure which he advocated two years ago. He employs a trocar about 8 cm. long and 0.4 cm. in diameter. He has the patient resting on two beds, the shoulders on one and the buttocks on the other. He selects the point of maximal dullness for the puncture and the patient is so placed on the beds that this point is lowermost during the tapping. When inserting the trocar, the patient may be rotated slightly, though the trocar should not be inserted when the patient is in the erect posture. The fluid is allowed to drain directly into an open vessel. Most exudates are under positive pressure, and the fluid escapes readily. After a certain amount has been evacuated, the pressure approaches zero, and finally becomes negative, at which point air rushes into the cavity with inspiration. It is not necessary to filter the air, Schmidt says, as he has never known any harmful results to follow the procedure. By having the patient in the position described, the evacuation of the fluid is much more complete than with the usual suction apparatus in the sitting posture. When the exudate is under negative pressure the fluid is practically always encapsulated. The pneumothorax produced appears to be beneficial. The author has not had to puncture the same pleural cavity more than twice. Roentgen-rays taken after the puncture are clearer, and show more definitely whether fluid is walled off in two or more pockets, and also whether marked lung changes are present. The author has also used this method in cases where the fluid was only slightly purulent, but in most cases of empyema the usual operative treatment is indicated.

**Duodenal Regurgitation and its Influence upon the Chemistry and Function of the Normal Human Stomach.**—SPENCER, MEYER, REHFUSS and HAWK (*Amer. Jour. Physiol.*, 1916, xxxix, 459) report a study of duodenal regurgitation in the normal human stomach. They employed fractional removal of the gastric contents by means of the Rehfuss tube. The experiments were all carried out on normal individuals whose last meal was that of the previous evening. The residuum was then removed, and the material under investigation was introduced into the stomach. Samples of 5 c.c. of gastric contents were then removed for study at intervals of ten minutes. This was continued until the stomach was empty. The presence of trypsin and of bile was used in determining whether regurgitation of duodenal contents had occurred. The authors found that trypsin is almost constantly demonstrable in the fasting and digesting contents of the normal human

stomach. They found normal individuals of the high acidity type usually yielded low trypsin values, while in those of the low acidity type tryptic power was marked. The latter fact suggested to the authors the possibility of tryptic digestion occurring in part in the stomach as a compensatory action in cases of low acid and pepsin secretion. They found that the introduction of 0.5 per cent. hydrochloric acid into the stomach is followed by a rapid reduction of acidity to about 0.2 per cent. hydrochloric acid or less. The fall in acidity is accompanied by a rise in tryptic values and by the presence of bile. The author's observations of the action of hydrochloric acid and pepsin upon trypsin are not without interest. Most of their experiments were done with freshly removed samples, but they have found "trypsin present in samples having an acidity of 110 c.c.  $\frac{N}{10}$  KOH which had stood for eighteen hours at room temperature. Other tests have shown that trypsin seems but little influenced by the acid and pepsin in the gastric contents." After introduction into the stomach of 5 per cent. sodium bicarbonate solution, it was found that if a prompt secretion of gastric juice failed, the solutions were held in the stomach for sometime and acquired high tryptic values and also underwent marked color changes. The retention appeared to be for the purpose of reducing the alkalinity in order to render the fluid harmless to the duodenum. With weaker solutions of alkali the secretion of acid by the stomach and neutralization were more prompt. Furthermore, fluid escaped from the stomach into the duodenum before the contents had become acid, thus indicating that acidity of the stomach contents is unnecessary for the opening of the pylorus in man, though Cannon has shown that it is in cats. The authors incline to the view that the human pylorus is controlled from the duodenum, acid fluid keeping the pylorus closed until the fluid in the duodenum is neutralized. In the human stomach, too, the authors find that weak sodium bicarbonate solutions have a stimulating effect on gastric secretion and at the same time hastens the emptying of the stomach.

---

**Notes on the Urochromogen Test in the Urine.**—PULAY (*München. med. Wochenschr.*, 1915, lxii, 1009) has made comparative tests of the diazo reaction of Ehrlich and the urochromogen test of Weiss. In 125 healthy adults and in 64 vaccinated against typhoid fever (12 freshly vaccinated) both tests were negative in all instances. Of 85 cases of typhoid fever with positive bacteriological findings each test was positive in 57 cases, and, in addition, the diazo test was weakly positive in 6 more. In 7 cases of tuberculosis the diazo test was positive in all, the urochromogen test in 5. The diazo test was also positive in all of 6 cases of pneumonia, the urochromogen test uniformly negative.

---

**The Effect of Diet on the Uric Acid Content of the Blood.**—DENIS (*Jour. Biol. Chem.*, 1915, xxiii, 147) has reported observations on the effects of diet on the concentration of uric acid in the blood, which are of interest to clinicians owing to the increased importance of uric acid determinations in the differential diagnosis of obscure arthritides. Her subjects were patients in the medical and surgical wards of the Massachusetts General Hospital. The surgical patients were normal individuals except for the surgical condition (hernia or fracture), for

which they entered the hospital. The medical patients studied were suffering from nephritis and cardiorenal disease and also from various chronic diseases not associated with renal insufficiency, or with fever. Patients with gout were not available during the course of the observations. The patients were studied during a period of purin-free diet and of diet rich in purin. The blood was all withdrawn before breakfast to obviate any possible effect of a recent meal. The results of this investigation are that in normal men no increase in the circulating uric acid is produced by ingestion of large quantities of purin, while in persons suffering from renal insufficiency a more or less marked increase in the uric acid content of the blood is produced by high purin feeding, as would be expected from the recently published findings of FOLIN and DENIS (*Arch. Int. Med.*, 1915, xvi, 33). The author, therefore, concludes that "when the determination of uric acid in the blood is undertaken as a diagnostic test the insistence on a preliminary period during which no purin containing foods are consumed is unnecessary except in the cases in which kidney insufficiency exists or perhaps in persons who habitually consume extremely large quantities of purin containing foods."

---

**The Diagnosis of Intestinal Perforation with the Aid of Roentgen Rays.**—POPPWE (*Deutsch. med. Wochenschr.*, August 26, 1915) calls attention to the possible use of Roentgen rays in the early diagnosis of gastric or intestinal perforation by the recognition of a clear crescent-shaped area between the dome of the liver and the diaphragm due to the accumulation of a small amount of free gas. This sign was first observed in a case of gastric ulcer with suspected perforation. Roentgen-ray examination showed this clear, crescentic area, but these findings were at first not properly interpreted. Later the patient developed a typical subdiaphragmatic abscess which was successfully drained. About a year later the patient died of carcinoma of the stomach. Subsequent studies of the Roentgen-ray plates showed that the clear, crescent-shaped area over the dome of the liver was due to the accumulation of a small amount of free gas and could be differentiated from the clear zone due to a misplaced and distended colon by: (a) The clear zone was crescent-shaped with its widest portion over the dome of the liver and becoming obliterated on both sides. (b) It is visible only when the patient is in the upright position since in the recumbent posture the gas accumulates between the surface of the liver and the anterior wall, and is therefore no longer visible in the Roentgen-ray plates. The possible importance of this sign in early diagnosis of gastric perforation following ulcer of the intestinal perforation in appendicitis or typhoid fever perhaps merits confirmation.

---

**Total Leukocyte and Differential Counts in Typhus Fever.**—MATHES (*Münch. med. Wochenschr.*, Oct. 5, 1915) calls attention to the difficulty at times in distinguishing typhus fever from cases of typhoid fever with a very pronounced roseola. From his blood examinations he believes that a combination of total white count with a differential count will aid in quickly making a differential diagnosis in these cases. At first thought this would seem scarcely necessary, as most text-books

associate typhus fever with a high-grade polynuclear leukocytosis, usually 20,000 or above. The author studied the blood of 55 cases in which typhoid fever was excluded by the clinical course, negative blood cultures and Widal tests. 34 of the 55 cases had counts of over 10,000 but only 3 showed more than 20,000 cells per c.mm., and of these 3, 2 were fatal, while the disease in the third ran a very severe course. The average count was between 10,000 and 15,000, while in 8 of the 55 cases the total count was from 7000 to 10,000 and in 12 others it varied between 4000 and 7000. In most cases during the febrile period the polymorphonuclear neutrophile average was 80 to 85 per cent., while the eosinophiles are strikingly absent. During convalescence there is apparently a postinfectious lymphocytosis associated with an eosinophilia. During this period the neutrophiles fall to 50 to 60 per cent., while the lymphocytes rise to 40 to 50 per cent., and the eosinophiles from 5 to 9 per cent. The differential diagnosis from typhoid is difficult usually only in two types of cases: first, cases of typhoid associated with a leukocytosis of 10,000 to 15,000 such as has been noted by several authors in recently vaccinated people. In these cases the differential count shows a normal formula or a mononuclear increase instead of a polynuclear increase seen in typhus fever; the second difficult group includes the cases of typhoid fever with a leukopenia as was present in 20 per cent. of the author's cases. Here again the typhus blood shows a polynuclear increase instead of the usual lymphocytosis of typhoid.

**Coagulation of Blood in the Pleural Cavity.**—DENNY and MINOT (*Am. Jour. Physiol.*, 1916, xxxix, 455) have made an experimental study of the fact noted clinically and experimentally that blood in the pleural cavity remains fluid or partially fluid and fails to coagulate after withdrawal. They summarize their findings as follows: Small amounts of blood introduced slowly into the pleural cavity when deep artificial respiration is maintained will remain in large part fluid. Small clots are always found in the pleural cavity, the size depending upon the amount of blood injected, and the rapidity of injection. The fluid portion of the blood can only be coagulated by the addition of fibrinogen. Thrombin, calcium and thromboplastin are incapable of causing coagulation. The blood shows absence of fibrinogen, which may perhaps be removed in some other way than by coagulation, but the authors found that pure fibrinogen solution which has been introduced in the pleural cavity under the same conditions not only is not altered but clots more readily than the control on adding suitable amounts of thrombin. Small amounts of thrombin and fibrinogen, however, when mixed in suitable proportions and injected slowly in the pleural cavity, remain fluid and show an absence of fibrinogen. Since it has been shown that fibrinogen solution loses none of its properties after remaining in the pleural cavity and that the presence of thrombin under the same conditions causes a disappearance of fibrinogen, we can only conclude, the authors say, that coagulation has taken place. The experiments with artificial solutions parallel those with whole blood, the conclusions being that blood which has been in the pleural cavity remains fluid, not because of any alteration of the elements, but because of previous coagulation and defibrillation.

**The Present Status of the Abderhalden Reaction.**—In a very full article BRONFENBRENNER (*Jour. Lab. and Clin. Med.*, 1915, i, 79) reviews the present status of the Abderhalden reaction and the theory of the so-called "Abwehr Fermente." The technic of the reaction is gone over in detail and particular reference given to the possible sources of error and the methods for the preparation of the substrata. After the general discussion, the author comes to the following rather important conclusions. These are based upon a careful analysis of the literature and particularly upon work which he and his co-workers have carried out: (1) The serum ferments are not specific. (2) The dialysable substances originate not from the substratum but from the serum. (3) In-so-far as the test is specific, its specificity depends on the presence in the blood of substances identical with the antibodies and not specific ferments. Provided all the precautions prescribed are carefully adhered to and controlled, one may obtain satisfactory results in a number of cases. In a certain number, however, no matter how carefully the test is carried out, the results obtained are not correct. In its present form, therefore, the test undoubtedly requires that the men who perform it be thoroughly trained in serology as well as in the chemistry of enzyme action. Though the test remains comparatively useful in special cases and the results obtained may justify the expenditure of the time of a highly-trained worker, Brenfenbrenner still feels that the results thus obtained should be taken with great reserve until some method has been elaborated which will permit easy standardization of the substrata. At the present time the amount of substratum used in a test cannot be uniform in all cases, for different immune sera react with various amounts of substratum according to the amount of the specific antibody present. Moreover in the case of normal sera, the amount of substratum capable of inducing auto-indigestion, varies. As it stands at present, therefore, the Abderhalden reaction has only a scientific interest, and in that its main value is in the fact that it has stimulated the student of the fermentative activities of the body fluids and specially of the blood. The studies reported continue more and more to deny Abderhalden's basic contention, namely, that the body is endowed with the ability to respond with the production of a specific ferment upon the parenteral introduction of foreign substances.

---

**Concerning Influenza.**—HUEBSCHMANN (*Münch. med. Wochenschr.* No. 32, 1915) made observations during an apparently typical epidemic of influenza in Leipzig. He considers the relation of the influenza bacillus of Pfeiffer to these epidemics and calls attention to the view expressed by some, that most of these epidemics of influenza are really due to the pneumococcus rather than the Pfeiffer bacillus which is present only as a saprophyte. Out of 110 cases studied, the true influenza bacillus was found in smears of the bronchial secretion 70 times, while it was present in pure culture in 30 cases. He concludes from his work that the true influenza bacillus of Pfeiffer was undoubtedly the cause of this epidemic. He emphasizes, furthermore, that the clinical picture is frequently that of a generalized infection and is not limited to the more common picture of a purely-localized, pulmonary disease. The relative mortality during this epidemic was stated to have been high but no actual figures are given.